

**I Claim:**

1. An apparatus for reducing clogs in a pneumatic material feed line,  
comprising:  
  
    a hollow housing defining a housing volume and having an inlet  
capable of connecting to an upstream portion of the pneumatic material  
feed line, an outlet capable of connecting to a downstream portion of the  
pneumatic material feed line, and an air vent located between the inlet and  
outlet for venting excess air pressure out from the housing volume; and  
  
    a diverter located at the inlet and in a path of incoming material  
from the upstream portion of the pneumatic material feed line, for breaking  
up clumps of said material impinging upon said diverter.
2. The apparatus of claim 1,  
  
    wherein the diverter is a pin extending in a transverse direction to  
the incoming material flow.
3. The apparatus of claim 1,  
  
    further comprising a first filter screen having a first pore size and  
located in the housing volume between the diverter and the outlet, for  
further breaking up clumps of said material impinging upon said first filter

screen and filtering therethrough material sized less than or equal to the first pore size.

4. The apparatus of claim 3,

further comprising a second filter screen located in the housing volume between the first filter screen and the outlet, for further breaking up clumps of said material impinging upon said second filter screen and filtering therethrough material sized less than or equal to the second pore size.

5. The apparatus of claim 4,

wherein the first pore size of the first filter screen is larger than the second pore size of the second filter screen.

6. The apparatus of claim 1,

wherein the inlet and the outlet are located at opposite ends of the housing.

7. An evenflow material distribution apparatus for use in a pneumatic material feed line of an abrasivejet machining system, said pneumatic material feed line connecting a pneumatic source and an abrasive material

supply at an upstream location to a hopper at a downstream location,  
comprising:

a hollow housing defining a housing volume and having an inlet adapted to connect to an upstream portion of the pneumatic material feed line, an outlet adapted to connect to a downstream portion of the pneumatic material feed line, and an air vent located between the inlet and outlet for venting excess air pressure out from the housing volume;

a diverter located at the inlet and in a path of incoming abrasive material from the upstream portion of the pneumatic material feed line, for breaking up clumps of said abrasive material impinging upon said diverter;

a first filter screen having a first pore size and located in the housing volume between the diverter and the outlet, for further breaking up clumps of said abrasive material impinging upon said first filter screen and filtering therethrough abrasive material sized less than or equal to the first pore size;  
and

a second filter screen located in the housing volume between the first filter screen and the outlet, for further breaking up clumps of said abrasive material impinging upon said second filter screen and filtering therethrough abrasive material sized less than or equal to the second pore size,

wherein the diverter, first filter screen, and second filter screen operate to reduce clogs in the pneumatic material feed line due to bridging/clumping of the abrasive material.

8. The evenflow material distribution apparatus of claim 7,

wherein the diverter is a pin extending in a transverse direction to the incoming abrasive material flow.

9. The evenflow material distribution apparatus of claim 7,

wherein the first pore size of the first filter screen is larger than the second pore size of the second filter screen.

10. The evenflow material distribution apparatus of claim 7,

wherein the inlet and the outlet are located at opposite ends of the housing.

11. A pneumatic material feed line comprising:

an upstream portion of the pneumatic material feed line;

a downstream portion of the pneumatic material feed line ;

a hollow housing defining a housing volume and having an inlet connected to the upstream portion of the pneumatic material feed line, an outlet connected to the downstream portion of the pneumatic material feed

line, and an air vent located between the inlet and outlet for venting excess air pressure out from the housing volume; and

a diverter located at the inlet and in a path of incoming material from the upstream portion of the pneumatic material feed line, for breaking up clumps of said material impinging upon said diverter to reduce clogs in the pneumatic material feed line.

12. The pneumatic material feed line of claim 11,

wherein the diverter is a pin extending in a transverse direction to the incoming material flow.

13. The pneumatic material feed line of claim 11,

further comprising a first filter screen having a first pore size and located in the housing volume between the diverter and the outlet, for further breaking up clumps of said material impinging upon said first filter screen and filtering therethrough material sized less than or equal to the first pore size.

14. The pneumatic material feed line of claim 13,

further comprising a second filter screen located in the housing volume between the first filter screen and the outlet, for further breaking up clumps of said material impinging upon said second filter screen and

filtering therethrough material sized less than or equal to the second pore size.

15. The pneumatic material feed line of claim 14,

wherein the first pore size of the first filter screen is larger than the second pore size of the second filter screen.

16. The pneumatic material feed line of claim 11,

wherein the inlet and the outlet are located at opposite ends of the housing.

17. The pneumatic material feed line of claim 11,

further comprising an air injector located downstream of the housing for supplying additional pneumatic pressure in a direction of the feed.

18. The pneumatic material feed line of claim 17,

wherein the air injector is located at an elbow of the pneumatic material feed line to accelerate material in an orthogonal direction to that of entry into the elbow.

19. The pneumatic material feed line of claim 11,

wherein the pneumatic material feed line supplies abrasive material to an abrasive waterjet machining system.

20. The pneumatic material feed line of claim 19,

wherein the pneumatic material feed line connects a pneumatic source and an abrasive material supply at an upstream location to a hopper at a downstream location.